

REMARKS

The following remarks are in response to the Final office action, dated March 7, 2003, and the advisory action dated May 21, 2003, for US patent application serial number 09/989,902, upon which this Continuation Application is based.

Reconsideration is requested of all rejections based on 35 U.S.C. 103:

Examiner has rejected claims 9 -11 as being unpatentable over Lu et al., U.S. Patent Publication No U.S. 2002/0110999 A1. The discussion below is in rebuttal of Examiner's 'Response to arguments'. Said response is in three parts each of which we reproduce below (along with Examiner's original numbering) followed immediately by the appropriate rebuttal:

5. In response to Applicants contention that Lu teaches away from Applicants invention because of the use of CVD, please note that the reference as a whole suggest Applicants claimed invention, particularly claims 9. Lu discloses in the background of the invention the use of a PVD process to deposit a liner/barrier and/or seed layer and discuss an overhang of the line/barrier and/or seed layer as a result of a PVD process (see paragraphs 0002-0005). Next, moving to Lu's detailed description of embodiments, Lu teaches PVD transition metals and Argon sputtering as well as a

TSMC98-615C

CMP process.

In our previous response, we pointed out that, while Lu described the same problem as the present invention does, Lu's solution is quite different from ours. In particular, while we teach a method that allows us to continue to use PVD as the method for depositing the seed/barrier layer, Lu teaches the replacement of PVD by CVD (see [0021] line 3). Examiner argues that Lu teaches, in his background section, that PVD is used by the prior art to form the barrier layer, so (according to examiner) Lu teaches use of both PVD and CVD as methods for depositing a barrier layer. We note again that Lu makes mention of PVD for the express purpose of teaching that PVD is NOT a good way to deposit a barrier layer (see [0004] lines 5-13). Thus, since **Lu expressly teaches away** from our claims, it is hard to see how this reference, in toto or in parte, could suggest the present invention.

Examiner has noted that Lu teaches deposition of transition metals by PVD. This is true but the teaching is for the use of these materials as a glue layer, use of PVD to deposit a seed or barrier layer being expressly rule out. Lines 11 and 12 of our claim 9 read as follows:

TSMC98-615C

"by means of PVD, depositing a seed layer of metal to coat the dielectric layer, said bottom surface, and said side walls;"

i.e. we teach deposition by PVD directly onto the walls of the cavity. Lu, on the other hand, deposits layer 124 onto the cavity bottom and sidewalls by means of CVD (see [0021] and his FIG. 2). Transition metal layer 126 is then deposited by PVD onto layer 124. Examiner could, conceivably, argue that it would have been obvious to also deposit layer 124 by PVD except that, as we have already pointed out, Lu himself teaches not to do so.

.....

6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, an improvement to reliable interconnects with low via/contact resistance suggest applicants claimed invention.

TSMC98-615C

The search for reliable interconnects with low via/contact resistance has certainly been a motivational force behind both the cited references and the present invention. However, two inventions that teach different solutions to the same problem are not patently indistinguishable from each other simply because they were similarly motivated!

.....

8. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Hong was used for the specific use of a sputtering chamber.

The above argument related to claims 11 and 12. In his first rejection, Examiner argued that it would have been obvious to combine Lu with Hong since Hong teaches a sputtering process. In response to our argument that Hong teaches sputter deposition while we teach sputter etching, examiner states that Hong is cited only for the specific

TSMC98-615C

use of a sputtering chamber. This is not understood because the only thing in common between Hong and the present invention is that both use a chamber. This does not change the fact that Hong's process is not the same as our process, the only thing in common between Hong and the present invention being the word "sputtering".

In conclusion, we again thank Examiner Coleman for his careful reading of our application.

Reconsideration and withdrawal of the rejection is respectfully requested.

Allowance of all Claims is requested. It is also requested that should Examiner Coleman not find that the Claims are now Allowable, he should please call the undersigned Attorney at (845)-452-5863 to overcome any problems preventing Allowance.

Respectfully submitted

A handwritten signature in black ink, appearing to be 'SBA', with a long horizontal line extending to the right.

Stephen B. Ackerman #37761